

**THREE-DIMENSIONAL COMPLETE BANDGAP PHOTONIC
CRYSTAL FORMED BY CRYSTAL MODIFICATION**

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ABSTRACT OF THE DISCLOSURE

A method of forming a three-dimensional (3D) complete photonic bandgap crystal by crystal modification is disclosed. The 3D crystal includes a first periodic array of unit cells formed from first voids connected by imaginary bonds. The first periodic array forms an incomplete bandgap. The first voids may be formed in any one
10 of a number of shapes, including spherical. The 3D crystal further includes a second periodic array of second voids. The second voids are arranged along the imaginary bonds so as to modify each unit cell. The modification of the unit cells is designed to form a complete photonic bandgap.

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